

2000 Edition Student Manual

6a

Carrier
Requirements
(Highway)



HAZARDOUS MATERIALS TRANSPORTATION TRAINING MODULES



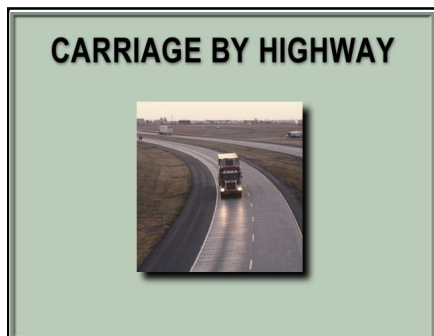
U.S. Department of Transportation
Research and Special Programs
Administration

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Narrative

1



Module 6A – Carrier Requirements (Highway)

2

SUBPART A*

Part 177 applies to:

- ☐ Private motor carriers
- ☐ Common motor carriers
- and
- ☐ Contract motor carriers

*If no shipping papers required, Subpart A does not apply

This module, Carrier Requirements (Highway), addresses the Hazardous Materials Regulations (HMR) in 49 CFR Part 177, “Carriage by Public Highway.” Motor carriers and others subject to Part 177 must also comply with the Federal Motor Carrier Safety Regulations (FMCSR) when they apply. This module addresses applicable requirements of the FMCSR in 49 CFR Parts 350-399.

397.2

3

Requirements for hazardous materials accepted and/or transported by:

- ☐ Private
- ☐ Contract "For-Hire" motor carriers

Shipping papers, marking, labeling and packaging.

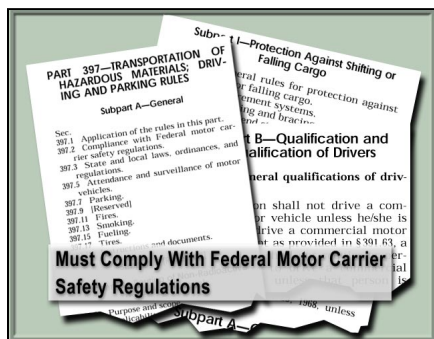
The module discusses requirements for hazardous materials accepted and/or transported by private, common and/or contract “for-hire” motor carriers. Part 177, requirements for highway, are in addition to those contained in Parts 171, 172, 173, 178 and 180 of the HMR. These requirements, such as shipping papers, marking, labeling and packaging, are discussed in Modules 1-5.

177.800(a)

STUDENT RESPONSE NOTES 1-3

The Carrier Requirements (Highway) Module discusses requirements in 49 CFR Part 177, for hazardous materials accepted and/or transported by private, common and/or contract _____ carriers.

4



The FMCSR in 49 CFR Parts 350-399 addressed in this module refer to driver qualifications, hours of service, equipment standards, driving and parking rules for transportation of hazardous materials, alcohol and controlled substances, financial responsibility and operational requirements.

177.804

STUDENT RESPONSE NOTE 4

If you are subject to the HMR, Part 177, you must _____ comply with the Federal Motor Carrier Safety Regulations, to the extent that they apply.

5

No Person May Offer or Accept a Hazardous Material for Transportation in Commerce Unless:

- ☐ The hazardous material is properly classed, described, packaged, marked and
- ☐ In proper condition for shipment.

No person may offer or accept a hazardous material for transportation in commerce unless that person is registered, if required, and the hazardous material is properly classed, described, packaged, marked, labeled, and in condition for shipment in accordance with the HMR. Motor Carrier and offeror (shipper) responsibilities frequently overlap. When a carrier performs a shipper function, the carrier is responsible for performing that function in accordance with the 49 CFR.

177.801**STUDENT RESPONSE NOTE 5**

Don't _____ or transport hazardous materials by motor vehicle unless the shipment complies with the HMR.

6

Both Carriers and Shippers are Responsible to Ensure Their Employees are Properly Trained as Required by the HMR

Both carriers and shippers are responsible to insure their employees are properly trained as required by the HMR.

A “hazmat employee” is anyone who directly affects hazardous materials transportation safety including an owner-operator of a motor vehicle which transports hazmat; a person (including a self-employed person) who:

- loads, unloads, or handles hazmat;
- tests reconditions, repairs, modifies, marks, or otherwise represents packagings as qualified for use in the transportation of hazmat;
- prepares hazmat for transportation; or
- operates a vehicle used to transport hazmat.

Before any hazmat employee performs a function subject to the HMR, that person must be provided initial training in the performance of that function. Each hazmat employee must be periodically retrained at least every three years.

171.8, 172.704

7**Motor Carriers Must Comply
With the HMR and Train
Employees in the Prescribed
Regulations.**

Motor carriers must comply with the HMR and train employees in the prescribed regulations.

The driver training regulations in Part 177 illustrate how the FMCSR are sometimes closely linked to related rules in the HMR. Part 177.816 mandates training in the requirements found in the FMCSR Parts 390-397. Part 177.816(a)(2) requires training in vehicle controls and equipment, including emergency equipment. The exact equipment required is found in FMCSR Part 383.

8**Additional Training Requirements
for Drivers of:**

- ☐ Cargo tanks, or
- ☐ Vehicles with portable tanks
- ☐ State Commercial Driver's License (CDL)
required by FMCSR

Part 177.816 also requires additional training for operators of cargo tanks or vehicles with portable tanks as well as the appropriate state commercial driver's license (CDL) required by FMCSR.

Question: Does a CDL with HM/tank vehicle endorsement satisfy the “hazmat employee” training requirements?

Answer: A hazmat employer must determine applicability of CDL to the specific functions the employee performs and provide training for functions not covered by the endorsement.

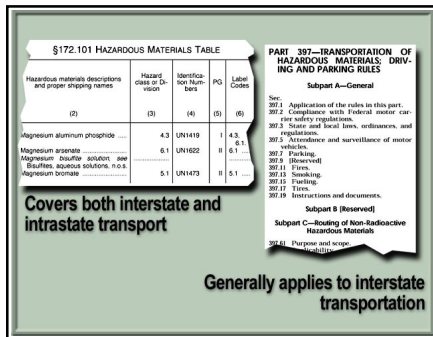
Please pause the presentation so you can read each of the HMR training requirements cited in the references below.

**HMR 172.700; 177.800; 177.816;
FMCSR 383.121**

STUDENT RESPONSE NOTE 6-8

The HMR, Parts 172.700 and 177.800 require carriers to ____ their employees in the applicable HMR and FMCSR.

9

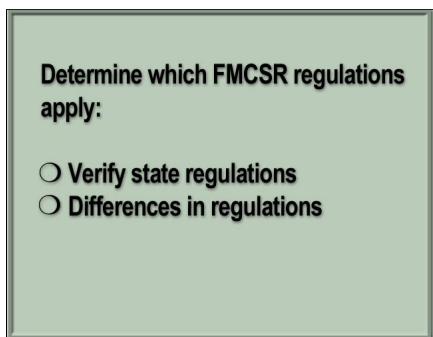


The jurisdiction of the HMR differs from that of the FMCSR. The HMR covers both interstate and intrastate transport. The FMCSR generally applies to interstate transportation – that is, between states – and not intrastate transportation, which stays entirely within a single state.

STUDENT RESPONSE NOTE 9

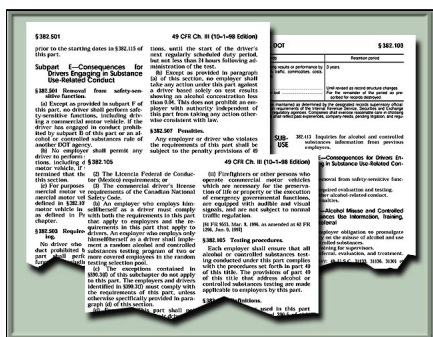
The HMR covers both interstate and _____ transport.

10



When determining which FMCSR regulations apply, it is also important to verify State regulations. The differences in regulations are important. For example, State, not Federal, regulations cover hours of service and qualification of drivers in strictly intrastate transport.

11




The FMCSR regulations on drug and alcohol testing and CDL, cover both interstate and intrastate transport; and FMCSR insurance regulations in some cases apply to intrastate as well as interstate transport.

12

Open to DOT, for:

- ☐ Safety examination and
- ☐ Inspection



All Carrier:

- ☐ Records
- ☐ Equipment
- ☐ Packagings
- ☐ Containers

USDOT representatives are authorized to conduct unannounced inspections of all motor carrier records, equipment, packaging and containers that may affect the safe transportation of hazardous materials. Unlike state and local police, they have the right of entry without probable cause or prior notification.

177.802

STUDENT RESPONSE NOTE 10-12

All motor carrier records, equipment, packagings and containers relating to the safe transport of hazardous materials must be available for _____ inspection.

13

URBAN/PUBLIC TUNNELS

Motor Carriers Transporting Hazardous Materials Must Comply With:

- ☐ State statutes
- ☐ Municipal ordinances

Many State statutes and municipal ordinances prohibit carriers from transporting hazardous material on restricted highways and through public tunnels. Motor carriers have to obey these laws as well as federal regulations unless an exemption has been authorized. The HMR does not nullify or supersede state statutes and municipal ordinances, regardless of the kind or quantity of hazardous material. Part 177.810 requires compliance with local ordinances regarding public tunnels, and FMCSR 397.3 requires compliance with state and local laws unless they are in disagreement with specific Federal requirements.

14

Part 397 of the 49 CFR FMCSR

- ☐ Driving and Parking
- ☐ Attendance and Surveillance
- ☐ Routing Regulations

Part 397 of the FMCSR covers driving and parking rules, including attendance and surveillance of parked vehicles and routing regulations for both radioactive and non-radioactive hazardous materials.

15**ROUTING REQUIREMENTS
Part 397**

- ☐ Non-Radioactive: Subpart C
- ☐ Radioactive: Subpart D

The requirements for routing of non-radioactive hazardous material shipments by motor vehicle, are in the FMCSR 49 CFR Part 397, Subpart C. Routing requirements for radioactive hazardous materials are found in Part 397, Subpart D.

177.810; 397.3

STUDENT RESPONSE NOTE 13-15

Motor carriers transporting hazardous materials must comply with State statutes and municipal ordinances restricting access to highways and public tunnels unless an _____ has been authorized.

16**Unless Excepted:**

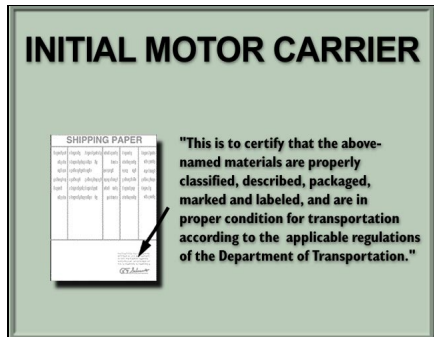
- ☐ A shipping paper must accompany EACH shipment of Hazardous Materials and
- ☐ Be prepared in accordance with:
 - 172.200
 - 172.201
 - 172.202
 - 172.203
- ☐ Shipping papers must be retained for one year by the offeror and the carrier.

Unless an authorized exception is provided, all hazardous material shipments must be accompanied by a properly prepared shipping paper. In addition, the Federal hazmat law (§ 5110, Chapter 51) requires the retention of the shipping paper for one year by the offeror and carrier. General requirements for shipping papers are reviewed in Module 2.

177.817(a)

STUDENT RESPONSE NOTE 16

Unless an authorized exception is provided, all shipments of hazardous materials must be _____ by a properly prepared shipping paper.

17

An initial motor carrier may not accept a hazardous material unless the shipping paper includes a properly completed shipper's certification.

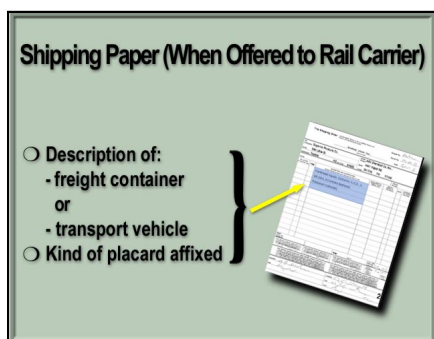
Except for hazardous waste, the shipper's certification is not required for:

- shipments transported entirely by the shipper as a private motor carrier, or
- bulk shipments transported in a cargo tank supplied by the motor carrier. Since the carrier, not the shipper, provides the packaging there is no need for a shipper's certification.

172.204, 177.817(b)

STUDENT RESPONSE NOTE 17

An initial motor carrier may not accept a hazardous material unless the shipping paper bears a completed shipper's _____ that complies with 172.204.

18

When a motor carrier offers a freight container or transport vehicle to a rail carrier, the shipping paper must be noted with:

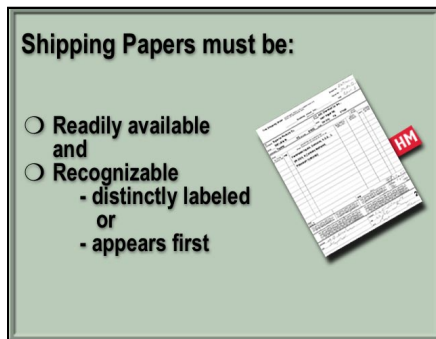
- a description of the freight container or transport vehicle, and
- the kind of placard affixed to the freight container or transport vehicle.

177.817(c)

STUDENT RESPONSE NOTE 18

For ____ transportation, motor carriers must mark the shipping paper with a description of the freight container or transport vehicle and the type of placard affixed.

19

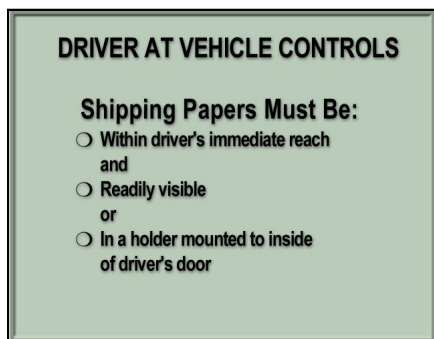


It is the responsibility of every motor carrier and driver to make sure that the shipping papers are readily available and accessible in case of an inspection or incident. In order to do this, shipping papers for hazardous materials must be clearly distinguished from all other shipping papers. This can be accomplished by tabbing the hazmat shipping papers, placing them on top of the stack of papers, or keeping them separate but still readily accessible.

STUDENT RESPONSE NOTE 19

Shipping papers must be kept readily available in case of an _____. Tab or clearly distinguish shipping papers from any other papers

20



When the driver is at the motor vehicle's controls, the shipping paper must be within the driver's immediate reach while restrained by a lap belt, and readily visible to a person entering the driver's compartment or in a holder mounted on the inside of the driver's door.

177.817(e)(2)(i)

STUDENT RESPONSE NOTE 20

When the driver is at the motor vehicle's controls, the shipping paper must be visible and within reach or in a holder mounted on the _____ of the driver's door.

21

DRIVER NOT AT VEHICLE CONTROLS**Shipping Papers Must Be:**

- ☐ In a holder mounted to inside of driver's door
- or
- ☐ On the driver's seat

When the driver is not at the motor vehicle's controls, the shipping paper must be:

- in the holder mounted to the inside of the driver's door, or
- on the driver's seat.

177.817(e)(2)(ii)

STUDENT RESPONSE NOTE 21

When the driver is not at the motor vehicle's controls, the shipping paper must be on the driver's ____ or in a holder mounted on the inside of the driver's door.

22

CARRIAGE BY PUBLIC HIGHWAY**Carrier Must Not Move Transport Vehicles:**

- ☐ Unless marked and placarded
- ☐ Except in Emergency, and:
 - escorted by government representativesor
- granted permission by DOT
- or
- to protect life and property

Marking and placarding requirements are in Subpart D & F of Part 172 of the 49 CFR. Except in an emergency, a transport vehicle containing a hazardous material may not be moved unless it displays all required markings and placards.

An improperly placarded or marked transport vehicle may be moved in an emergency, if:

- escorted by a state or local government representative,
- the motor carrier has permission from the USDOT, or
- movement of the transport vehicle is necessary to protect life or property.

177.823(a)

STUDENT RESPONSE NOTE 22

Except in an _____, a transport vehicle must not be moved unless it displays all required markings and placards.

23

Disabled Motor Vehicle in Transit

- ☐ Motor Vehicle - guard/move to safe place
- ☐ Broken/leaking containers - handle safely
- ☐ Packages - repair/place in a salvage drum

When a motor vehicle transporting a hazardous material becomes disabled, care must be taken to guard the vehicle and its load. Every effort must be made to remove the motor vehicle to a place that can provide protection for the hazardous material. Broken or leaking containers in transit must be handled by the safest practice available. These packages may be repaired, if safe to do so. A broken or leaking package may be placed in a salvage drum and transported to its destination or returned to the shipper.

Please pause the presentation so you can read the requirements for disabled vehicles and broken or leaking packages in 177.854.

177.854(a)-(h)

STUDENT RESPONSE NOTE 23

Hazard protection must be provided when vehicles become _____. Broken or leaking containers and other packages may be repaired or placed in a salvage drum for further transportation.

24

Leaking Cargo Tanks

- ☐ Remove from highway
- ☐ Contain leak
- ☐ Eliminate sources of ignition

When a leak in a cargo tank makes further transportation unsafe,

- the cargo tank should be removed from the traveled portion of the highway,
- the leaking material contained to prevent contamination of streams and sewers, and
- all sources of ignition eliminated.

177.823(b)

25**Movement of Leaking Cargo Tanks**

- ☐ To the nearest place for safe removal of contents

Leaking cargo tanks may be moved only to the nearest place where the contents can be disposed of safely. The operator shall use all available means to prevent leakage or spillage on the highway.

177.823(c)

STUDENT RESPONSE NOTE 24-25

When a leak in a cargo tank makes further transportation _____, the tank should be removed from the traveled portion of highway, the leaking material contained to prevent contamination of streams and sewers, and all sources of ignition eliminated.

26**Hazardous Materials Must Be:**

- ☐ Loaded
 - ☐ Blocked, Braced and
 - ☐ Unloaded
- In accordance with the prescribed safeguards



Hazardous materials must be loaded, blocked, braced, and unloaded in accordance with the prescribed safeguards. Special handling, loading and unloading and attendance requirements for explosives (Div. 1.1, 1.2 and 1.3) are found in 49 CFR 177.835 and 397.5.

Please pause the presentation so you can read and become familiar with these general requirements, found in 177.834(a)-(n). For other than cargo tanks, see 49CFR 397.5 in the FMCSR.

177.834; 177.835

STUDENT RESPONSE NOTE 26

General requirements for _____ and unloading of hazardous materials are specified in 49 CFR 177.834.

27

**SPECIAL LOADING AND
UNLOADING REQUIREMENTS
Class 1 (Explosives)**

- ☐ Motor vehicle engine must not be running
- ☐ No sharp projections inside the vehicle
- ☐ Tailgates must be closed
- ☐ Cargo must remain in body of vehicle

Special requirements for loading and unloading of motor vehicles are contained in 49 CFR 177.835-177.842.

There are specific loading and unloading requirements for hazard classes 1 through 8. Additional attendance requirements are found in 49 CFR 171.5.

For example, let's look at some hazard class specific requirements. For Class 1 (explosives), the rules include:

- vehicle engine must be turned off during loading and unloading;
- cargo area interior must be free of projections – such as bolts, screws or nails – that could damage a package or container;
- tailgates must be closed; and
- cargo must remain within the body of the vehicle.

177.835

28

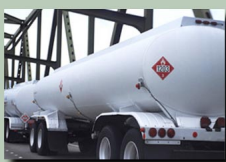
**SPECIAL LOADING AND
UNLOADING REQUIREMENTS****Storage Batteries With Electrolyte**

- ☐ Protect against falling cargo
- ☐ Protect/insulate battery terminals

Part 177 provides special requirements for storage batteries containing electrolyte if loaded with other cargo. A storage battery must be loaded so other cargo does not fall onto or against it. Battery terminals must be adequately protected and insulated against short circuits.

177.839

29

**SPECIAL LOADING AND
UNLOADING REQUIREMENTS**

Part 177 includes special requirements for cargo tank motor vehicles that transport Class 3 (flammable liquid) materials. Cargo tanks must be bonded and grounded if the cargo tank is loaded through an open filling hole.

Grounding and bonding is not required if the cargo tank is loaded or unloaded through either a vapor tight connection or unloaded through a non-vapor tight connection.

177.837

30

SPECIAL LOADING AND UNLOADING REQUIREMENTS**Cylinders Containing Class 2 (Compressed Gas):**

- ☐ Lash in an upright position, or
- ☐ Load into securely attached racks, or
- ☐ Pack in boxes or crates/no overturning, or
- ☐ Load horizontally

A cylinder containing compressed gas must be protected from damage. It must be:

- securely lashed in an upright position,
- loaded into racks attached to the motor vehicle,
- packed in boxes or crates, or
- loaded horizontally.

Please pause the presentation so you can read 49 CFR 177.840(a)(1).

177.840(a)

STUDENT RESPONSE NOTE 27-30

Special loading and unloading requirements and safety precautions for _____ hazard classes of materials are found in 49 CFR 177.835 through 177.842.

31

SEGREGATION TABLE

SEGREGATION TABLE FOR HAZARDOUS MATERIALS											
Class or division	Notes	1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gen. zone A	2.3 gen. zone B
Explosives 1.1 and 1.2	A	-	-	-	-	-	-	X	X	X	X
Explosives 1.3	-	-	-	-	-	-	-	X	X	X	X
Explosives 1.4	-	-	-	-	-	-	-	X	X	X	X
Very insensitive explosives 1.5	A	-	-	-	-	-	-	X	X	X	X
Extremely insensitive explosives 1.6	-	-	-	-	-	-	-	-	-	-	-
Flammable gases 2.1	-	X	X	O	X	X	-	-	-	X	O
Non-toxic, non-flammable gases 2.2	-	X	X	O	X	X	-	-	-	X	O

No Restrictions Apply:

- ☐ Blank space in table
- ☐ Hazard class or division not in table

Certain hazardous materials must be separated in a manner that, in the event of leakage from packages, commingling would not occur. The segregation and separation chart of hazardous materials applies to materials in one or more hazard class in packages which require labels, in a compartment within a multi-compartmented cargo tank, or in a portable tank loaded in a transport vehicle or freight container.

Please turn to 177.848, the “Segregation Table for Hazardous Materials”. This table shows the segregation requirements for hazard classes and divisions. A hazard class or division that is not shown is not restricted. For example, hazard Class 9 is not restricted. A blank space in the table also indicates no restrictions apply. Additional instructions for using the table are found in 177.848(e).

177.848(e)

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SEGREGATION TABLE FOR HAZARDOUS MATERIALS											
Class or division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas zone A	2.3 gas zone B	3 4.1
Explosives 1.1 and 1.2	A	*	*	*	*	*	X	X	X	X	X
Explosives 1.3		*	*	*	*	*	X	X	X	X	X
Explosives 1.4		*	*	*	*	*	X	X	X	X	X
Very insensitive explosives 1.5	A	*	*	*	*	*	X	X	X	X	X
Extremely insensitive explosives 1.6		*	*	*	*	*	X	X	X	X	X
Flammable gases 2.1		X	X	O	X				X	O	
Non-toxic, non-flammable gases 2.2		X			X						

X = No
O = OK, Provided...
A = Fertilizer Allowance
*** = Use Compatibility Table in 177.848(f)**

Notice the table in 177.848 contains a series of X's and O's.

An "X" in the box where a row and a column intersect, means that the two materials may not be loaded, transported on the same vehicle or stowed together. When an "O" appears, the materials may be loaded, transported and/or stowed together provided certain conditions are met.

177.848(e)

33

SEGREGATION TABLE FOR HAZARDOUS MATERIALS											
Class or Division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas zone A	2.3 gas zone B	3 4.1
Explosives 1.1 and 1.2	A	*	*	*	*	*	X	X	X	X	X
Explosives 1.3		*	*	*	*	*	X	X	X	X	X
Explosives 1.4		*	*	*	*	*	X	X	X	X	X
Very insensitive explosives 1.5	A	*	*	*	*	*	X	X	X	X	X
Extremely insensitive explosives 1.6		*	*	*	*	*	X	X	X	X	X
Flammable gases 2.1		X	X	O	X				X	O	
Non-toxic, non-flammable gases 2.2		X			X						
Poisonous gas Zone A 2.3		X	X	O	X				X	O	X
Poisonous gas Zone B 2.3		X	X	O	X				X	O	X
Flammable liquids 3		X	X	O	X				X	O	X
Flammable solids 4.1		X	X	O	X				X	O	X
Spontaneously combustible materials 4.2		X	X	O	X				X	O	X
Dangerous when wet materials 4.3		X	X	O	X				X	O	X
Oxidizers 5.1	A	X	X	O	X				X	O	X
Organic peroxides 5.2		X	X	O	X				X	O	X
Poisonous liquids PG I Zone A 6.1		X	X	O	X				X	O	X
Radioactive materials 7		X	X	O	X				X	O	X
Corrosive liquids 8		X	X	O	X				X	O	X

Student Activity

Take your ruler or paper marker and place it across the page under the row "Poisonous gas (Div. 2.3), Zone A." Keep your ruler in place and find the Class 3 (flammable liquid) column. Follow that column down the page to its intersection with Division 2.3, Zone A. There is an "X" in the block where Div. 2.3, Zone A row and Class 3 column intersect. Do not load, transport, or stow these materials together.

Use the same procedure for Class 3 and Division 2.2 materials. The area where these intersect is blank. Those materials may be loaded, transported, and stored together.

177.848(e)

34

SEGREGATION TABLE FOR HAZARDOUS MATERIALS											
Class or division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas zone A	2.3 gas zone B	3 4.1
Flammable gases 2.1		X	X	O	X				X	O	
Non-toxic, non-flammable gases 2.2		X			X						
Poisonous gas Zone A 2.3		X	X	O	X				X	O	X
Poisonous gas Zone B 2.3		X	X	O	X				X	O	X
Flammable liquids 3		X	X	O	X				X	O	X
Flammable solids 4.1		X	X	O	X				X	O	X
Spontaneously combustible materials 4.2		X	X	O	X				X	O	X
Dangerous when wet materials 4.3		X	X	O	X				X	O	X
Oxidizers 5.1	A	X	X	O	X				X	O	X
Organic peroxides 5.2		X	X	O	X				X	O	X

Now find the row for division 5.1 (Oxidizers) and the column for Class 3 (flammable liquid). There is an "O" where these intersect. The instructions for using the Table indicates that these materials may be loaded, transported, or stored together – as long as a separation is maintained.

177.848

35

SEGREGATION TABLE FOR HAZARDOUS MATERIALS												
Class or division	Notes	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	2.4	3	4.1
Explosives 1 and A	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 1.2	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 1.3	A	-	-	-	-	-	A	A	A	A	A	A
Explosives 1.4	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 1.5	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 1.6	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 2.1	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 2.2	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 2.3	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 2.4	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 3	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.1	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.2	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.3	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.4	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.5	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.6	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.7	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.8	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.9	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.10	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.11	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.12	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.13	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.14	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.15	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.16	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.17	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.18	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.19	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.20	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.21	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.22	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.23	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.24	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.25	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.26	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.27	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.28	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.29	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.30	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.31	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.32	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.33	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.34	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.35	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.36	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.37	-	-	-	-	-	-	A	A	A	A	A	A
Explosives 4.												

Notice that the explosives in 177.848 have an asterisk in Columns 1.1 through 1.6. The asterisk indicates that segregation among different Class 1 (explosive) materials is governed by the Compatibility Table shown in the visual. Turn to 177.848(f) and review the Compatibility Table for Class 1 materials.

177.848(e)(4); 177.848(f)

STUDENT RESPONSE NOTE 31-35

In the _____ Table for Hazardous Materials, if “X” marks the intersection, don’t load, transport or store the materials together.

Student Activity

Turn to page 25 in your student manual, read the instructions and complete Work Project C-1. When you have completed and checked your work for accuracy, either review the work project with your instructor or check the answers on page 33. Please pause the presentation and complete the Student Activity.

36

SPECIAL LOADING AND UNLOADING REQUIREMENTS

Packages Labeled "POISON" or "POISON INHALATION HAZARD"

- Do not transport with food or animal feed unless
- Overpacked in metal drums authorized in 173.25(c) or
- Loaded in closed unit load device and food/animal feed is in another closed unit

Part 177 provides special requirements for packages labeled “TOXIC” or “POISON”. Packages labeled “TOXIC,” “POISON,” or “POISON INHALATION HAZARD” may not be transported in the same motor vehicle with foodstuff, feed or edible material unless the package is:

- overpacked in a metal drum as provided in 173.25(c) of the HMR, or
- loaded in a closed unit load device and the foodstuff, feed or edible material is loaded in another closed unit load device.

177.841(e)(1)

37



Packages bearing the “KEEP AWAY FROM FOOD” label must also be kept separate from foods, feed, or other edible materials. Refer to 177.841(e)(3) for separation requirements.

177.841(e)(3)

NOTE: The “KEEP AWAY FROM FOOD” label was eliminated, effective October 1, 1999. However, it may continue in use until October 1, 2003 in domestic transportation.

STUDENT RESPONSE NOTE 36-37

A package bearing a “_____”, “POISON” or “POISON-INHALATION HAZARD” label must not be transported with food or feed unless overpacked according to the HMR.

38



A package labeled “TOXIC,” “POISON,” “TOXIC GAS,” “POISON GAS,” or “POISON-INHALATION HAZARD” may not be transported in the driver’s compartment or sleeper berth of a motor vehicle.

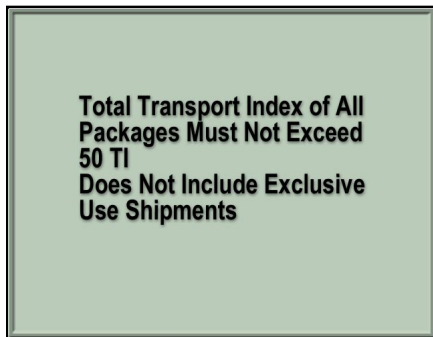
177.841(e)(2)

STUDENT RESPONSE NOTE 38

A package labeled “TOXIC,” “POISON,” “TOXIC GAS,” “POISON-GAS,” or “POISON-INHALATION HAZARD” is not permitted in the _____ compartment or sleeper berth of a motor vehicle.

39

The number of radioactive material packages in a storage location or transported in a motor vehicle is limited so that the total transport index number (TI) does not exceed 50. Transport Index (TI) is the Geiger counter reading one meter from the package containing radioactive material. The total TI is the sum of the TI on the labels of individual packages and overpacks. The TI is used to determine the minimum separation distance in meters (feet) to nearest undeveloped film in various stages of transportation.

40

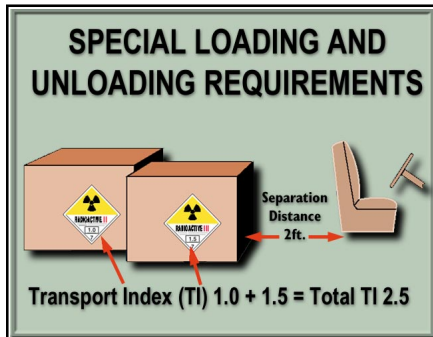
The limitation that the total transport index number may not exceed 50, does not apply to exclusive use shipments, meaning motor vehicles used only to transport that material or commodity by a single shipper. “Exclusive use” and “transport index” are defined in 173.403 of the HMR.

177.842(a)

STUDENT RESPONSE NOTE 39-40

The total transport index number (TI) on packages of _____ material in a motor vehicle or storage area must not exceed 50 TI.

41

**Student Activity**

Look at two packages labeled “RADIOACTIVE” in the visual. One package reflects a TI of 1.0. The second package reflects a TI of 1.5. The total TI is 2.5; this is well under the 50 TI limit.

In a motor vehicle, a package of “RADIOACTIVE YELLOW-II” or “RADIOACTIVE YELLOW-III” labeled packages must be kept away from areas used by humans or animals in accordance with the minimum separation distances prescribed in the table in 177.842(b).

The minimum distances for radioactive materials to be separated from humans, animals, or undeveloped film is listed in the table found in 177.842.

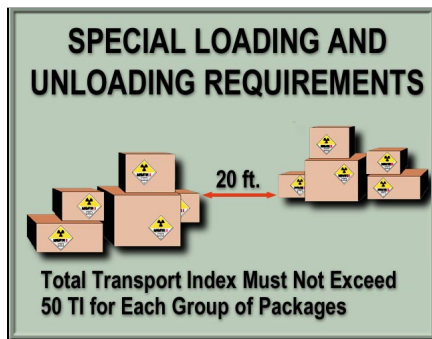
The distance is computed from the table on the basis of the total TI. Add the TI numbers on the labels of individual packages and overpacks.

177.842(b)

STUDENT RESPONSE NOTE 41

For more than one radioactive material package, add the TIs to determine _____ allowable distance.

42



No group of “RADIOACTIVE YELLOW-II” or “YELLOW-III” labeled packages may have a total TI of more than 50 in any single storage location. Each group of packages must be handled and stowed no closer than 6 meters (20 feet) to any other such group, measured edge to edge.

177.842(b)

STUDENT RESPONSE NOTE 42

“RADIOACTIVE YELLOW-II” or “YELLOW-III” labeled packages must not exceed ___ TI in one group of packages in one storage location.

Student Activity

Assuming a total TI of 2.5 for packages labeled “RADIOACTIVE YELLOW-II” or “YELLOW-III” material, determine the minimum separation distance.

First, locate the total TI in Column one of the 177.842 table.

Next, follow across the table to the last column and find the “minimum distance in meters (feet) to any area of persons...”

For a TI of 2.5, the minimum distance is 0.6 meter (2 feet).

43



Each motor vehicle used to transport radioactive materials under exclusive use conditions must be checked for radiation contamination after each such use. The examination must be performed with radiation detection instruments. A motor vehicle may not be returned to service until the radiation dose rate meets acceptably low levels.

177.843(a)

STUDENT RESPONSE NOTE 43

Motor vehicles used for _____ use radioactive material shipments must be checked for contamination after each use.

44


The requirements applicable to radioactive surface contamination of a motor vehicle under exclusive use do not apply to any vehicle used solely for transporting Class 7 (radioactive) material under the conditions and limitations specified in 177.843(b).

177.843(b)

45


The vehicles must be stenciled with the words “For Radioactive Materials Use Only.” The stencil lettering must be at least three (3) inches high in a conspicuous place on both sides of the vehicle exterior. Also, these vehicles must be kept closed “at all times” except when being loaded or unloaded.

NOTE: “Solely” means the vehicle never transports anything but radioactive materials. “Exclusive use” means this shipment includes only radioactive materials.

177.843(b)

STUDENT RESPONSE NOTE 44-45

Vehicles used solely for transport of radioactive materials must be marked “For Radioactive Materials Use ____.”

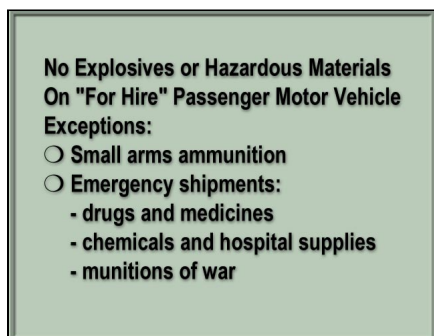
REGULATIONS APPLYING TO HAZARDOUS MATERIAL ON MOTOR VEHICLES CARRYING PASSENGERS FOR HIRE

46



In addition to other requirements of the HMR, hazardous materials may be transported on motor vehicles carrying passengers for hire. However, certain conditions and limitations apply to this type of hazardous materials transportation.

177.870**47**



No hazardous materials, including explosives, are authorized for transportation on motor vehicles carrying passengers for hire where other practicable means of transport is available, except small arms ammunition, emergency shipments of drugs, chemicals and hospital supplies, and accompanying munitions of war.

Please pause the presentation so you can review the specific limitations and conditions relating to these shipments in 49 CFR 177.870(b).

STUDENT RESPONSE NOTE 46-47

With certain limitations and conditions, hazardous materials may be transported on motor vehicles carrying _____ for hire, where no other practical means is available.



This concludes the instruction and practice portion of this module. Now is the time to assess how well the module taught you. This will be an open book test. There are no “trick” questions. Unless instructed otherwise, please complete the **Module 6A Test**. The **Module 6A Test** begins on page 28 of your Student Manual.

Instructor Note:

Please check test answers, record scores, and update training records. Review test results with students.

STUDENT RESPONSE NOTE ANSWERS begin on page 31.

WORK PROJECT ANSWERS begin on page 33.

Carriers Summary

Carriage by Public Highway, Part 177

• Class 7 (radioactive materials)	177.842
• Disabled Vehicles	177.854
• Div. 6.1 (poisonous), Div. 2.3 (poisonous gas) materials	177.841
• Driving and Parking Rules	397.1-19
• FMCSR Compliance	177.804
• Loading and Unloading: General Requirements	177.834
• Loading and Unloading: Specific Requirements	177.835
• Movement of Motor Vehicles in Emergencies	177.823
• Passenger Vehicles	177.870
• Registration	107.601-620
• Routing of Class 7 (Radioactive) Materials	397.101-103
• Segregation and Separation Chart	177.848
• Shipping Papers	177.817
• Training	172.700-704 and 177.816
• Unacceptable Hazardous Material Shipments	177.801
• Vehicular Tunnels	177.810

Work Project

Carrier Requirements (Highway) Work Project Work Project C-1

Directions to Student(s)

The object of the work project is to provide a practical exercise in determining Hazardous Materials Regulations (HMR) requirements for motor carriers.

Work Project C-1 has 9 questions. Select the correct answer and give the HMR reference supporting your answer.

Self-Evaluation

The work project will evaluate your skill and facility in determining motor carrier requirements under the HMR. When you have completed and checked your work for accuracy, either review the work project with the instructor or check the answers on page 33.

Carrier Requirements (Highway) Work Project

Work Project C-1

Please select the correct answer and provide the supporting HMR section reference.

1. It is the duty of each private, common and contract motor carrier to thoroughly train hazmat employees in the applicable HMR.

- a. True
- b. False

Section _____

2. No person may accept for transportation or transport by motor carrier any shipment of hazardous material(s) that is not in total compliance with the HMR.

- a. True
- b. False

Section _____

3. All records, equipment, packaging and containers under the carrier's control, insofar as safety in transportation is concerned, must be made available for inspection by USDOT.

- a. True
- b. False

Section _____

4. When the driver is at the controls of a motor vehicle containing hazardous materials, the required shipping paper shall be _____.

- a. within the driver's immediate reach while restrained by a lap belt
- b. either readily visible or in a holder on the inside of the driver's door
- c. in the motor vehicle's glove compartment
- d. a and b

Section _____

5. When the driver is not at the controls of the motor vehicle containing hazardous materials, the required shipping paper must be in the driver's possession.

- a. True
- b. False

Section _____

6. Unless in an emergency, a carrier may not move a transport vehicle containing a hazardous material without the required marking and placarding.

a. True
b. False

Section _____

7. Smoking on or about a motor vehicle is prohibited while loading or unloading any Class 3 (flammable liquid), Class 4.1 (flammable solid), Division 5.1 and 5.2 (oxidizers and organic peroxides) or Division 2.1 (flammable gases).

a. True
b. False

Section _____

8. A motor carrier may transport a package bearing a TOXIC or POISON label in the same motor vehicle with dog food, provided the material is overpacked in accordance with 173.25(c).

a. True
b. False

Section _____

9. The Segregation and Separation Chart of Hazardous Materials does not permit the following materials to be loaded, transported and stored together.

a. Class 3 (flammable liquids) and Class 8 (corrosive) liquids
b. Div. 5.1 (oxidizers) and Div. 2.3 (poisonous gas, Zone A) materials
c. Div. 4.1 (flammable solids) and Div. 5.2 (organic peroxides) materials
d. None of the above

Section _____

Module 6A Test

1. You may not smoke or carry any lighted material when loading or unloading _____ .
 - a. flammables
 - b. explosives
 - c. oxidizers
 - d. all of the above
2. It's the duty of each private, contract and common carrier to thoroughly instruct hazmat employees in the applicable HMR.
 - a. True
 - b. False
3. When a driver is at the controls of a motor vehicle containing hazardous material, the required shipping paper must be _____ .
 - a. within the driver's immediate reach while restrained by a lap belt
 - b. either readily visible or in a holder on the inside of the driver's door
 - c. in the motor vehicle's glove compartment
 - d. a and b
4. Shipments of hazardous material must comply with the HMR before anyone may accept them for transport.
 - a. True
 - b. False
5. All records, equipment and packages relating to transportation safety that are under a motor carrier's control must be available for USDOT inspection.
 - a. True
 - b. False
6. The Segregation and Separation Chart of Hazardous Materials permits the following materials to be loaded, transported and stored together.
 - a. Div. 2.2 (Helium, compressed) and Div. 1.5D (Explosive, blasting, type B)
 - b. Class 6.1 (Iron Pentacarbonyl) and Class 8 (Compound, cleaning liquid)
 - c. Class 3 (Acetone) and Div. 2.3 (Fluorine, compressed)
 - d. Class 3 (Gasoline) and Div. 4.3 (Magnesium hydride)

7. A motor vehicle may transport a package bearing a “TOXIC”, “POISON” or “POISON-INHALATION HAZARD” label in the same motor vehicle with a foodstuff or animal feed.
 - a. True
 - b. False
8. In an emergency, DOT may permit a motor carrier to move an unmarked and/or unplacarded motor vehicle containing hazardous material.
 - a. True
 - b. False
9. Motor carriers may transport hazardous materials through urban/public vehicular tunnels used for mass transportation. However, with the exception of radioactive materials, the transportation must be performed in accordance with state and local requirements.
 - a. True
 - b. False
10. Which of the following hazard classes use a transport index?
 - a. flammable
 - b. radioactive
 - c. explosives
 - d. poison gas
11. The total transport index (TI) of all packages in a single vehicle is:
 - a. 50
 - b. 500
 - c. 25
 - d. 30
12. Foodstuff should not be carried in the same vehicle as:
 - a. corrosives
 - b. flammable gas
 - c. poisons
 - d. oxidizers

13. Who must certify that a shipment has been prepared according to the HMR?
 - a. driver
 - b. carrier
 - c. consignee
 - d. shipper

14. Cargo tanks have the same placarding requirements as any type vehicle transporting hazardous materials.
 - a. True
 - b. False

Answer Sheets

Student Response Note Answers

- 1-3 The Carrier Requirements (Highway) Module discusses requirements in 49 CFR Part 177, for hazardous materials accepted and/or transported by private, common and/or contract motor carriers.
- 4 If you are subject to the HMR, Part 177, you must also comply with the Federal Motor Carrier Safety Regulations, to the extent that they apply.
- 5 Don't accept or transport hazardous materials by motor vehicle unless the shipment complies with the HMR.
- 6-8 The HMR, Parts 172.700 and 177.800 require carriers to train their employees in the applicable HMR and FMCSR.
- 9 The HMR covers both interstate and intrastate transport.
- 10-12 All motor carrier records, equipment, packagings and containers relating to the safe transport of hazardous materials must be available for USDOT inspection.
- 13-15 Motor carriers transporting hazardous materials must comply with State statutes and municipal ordinances restricting access to highways and public tunnels unless an exemption has been authorized.
- 16 Unless an authorized exception is provided, all shipments of hazardous materials must be accompanied by a properly prepared shipping paper.
- 17 An initial motor carrier may not accept a hazardous material unless the shipping paper bears a completed shipper's certification that complies with 172.204.
- 18 For rail transportation, motor carriers must mark the shipping paper with a description of the freight container or transport vehicle and the type of placard affixed.
- 19 Shipping papers must be kept readily available in case of an incident. Tab or clearly distinguish shipping papers from any other papers.
- 20 When the driver is at the motor vehicle's controls, the shipping paper must be visible and within reach or in a holder mounted on the inside of the driver's door.
- 21 When the driver is not at the motor vehicle's controls, the shipping paper must be on the driver's seat or in a holder mounted on the inside of the driver's door.

- 22 Except in an emergency, a transport vehicle must not be moved unless it displays all required markings and placards.
- 23 Hazard protection must be provided when vehicles become disabled. Broken or leaking containers and other packages may be repaired or placed in a salvage drum for further transportation.
- 24-25 When a leak in a cargo tank makes further transportation unsafe, the tank should be removed from the traveled portion of highway, the leaking material contained to prevent contamination of streams and sewers, and all sources of ignition eliminated.
- 26 General requirements for loading and unloading of hazardous materials are specified in 49 CFR 177.834.
- 27-30 Special loading and unloading requirements and safety precautions for certain hazard classes of materials are found in 49 CFR 177.835 through 177.842.
- 31-35 In the Segregation Table for Hazardous Materials, if “X” marks the intersection, don’t load, transport or store the materials together.
- 36-37 A package bearing a “TOXIC”, “POISON” or “POISON-INHALATION HAZARD” label must not be transported with food or feed unless overpacked according to the HMR.
- 38 A package labeled “TOXIC,” “POISON,” “TOXIC GAS,” “POISON-GAS,” or “POISON-INHALATION HAZARD” is not permitted in the driver’s compartment or sleeper berth of a motor vehicle.
- 39-40 The total transport index number (TI) on packages of radioactive material in a motor vehicle or storage area must not exceed 50 TI.
- 41 For more than one radioactive material package, add the TIs to determine minimum allowable distance.
- 42 “RADIOACTIVE YELLOW-II” or “YELLOW-III” labeled packages must not exceed 50 TI in one group of packages in one storage location.
- 43 Motor vehicles used for exclusive use radioactive material shipments must be checked for contamination after each use.
- 44-45 Vehicles used solely for transport of radioactive materials must be marked “For Radioactive Materials Use Only.”
- 46-47 With certain limitations and conditions, hazardous materials may be transported on motor vehicles carrying passengers for hire, where no other practical means is available.

Carrier Requirements (Highway) Work Project Answers

Work Project C-1

Question	Answer/Explanation	49 CFR Reference
1.	a.	177.800(c)
2.	a.	177.801
3.	a.	177.802
4.	d. The shipping paper shall be within the driver's immediate reach while restrained by a lap belt; and either readily visible or in a holder on the inside of the driver's door.	177.817(e)(2)(i)
5.	b. When the driver is not at the controls of the motor vehicle, the shipping paper shall be in a holder mounted to the inside of the door on the driver's side of the vehicle; or on the driver's seat in the vehicle.	177.817(e)(2)(ii)
6.	a. The vehicle must be marked and placarded.	177.823(a)(1-3)
7.	a.	177.834(c)
8.	a.	177.841(e)
9.	b. There is an "X" where the columns in the Segregation and Separation Chart intersect for these materials. There is no "X" for the material in a and c.	177.848